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(56) Documents cited
GB 2236346 A **GB 2133069 A** **US 5016414 A**
US 4643787 A **US 4550540 A** **US 4236365 A**

(58) Field of search
 UK CL (Edition K) **E1J JGL JGS**
 INT CL⁵ **E06B**

(54) **Recessed plastic door panel**

(57) A door panel comprising a rectangular frame formed of two side bars and two end bars which are made from a plastic material through the process of injection molding, two opposite face panels adhered to said rectangular frame at two opposite sides, a plurality of edge strips peripherally fastened between said two opposite face panels around said rectangular frame, and a foamed plastic filled through bolt holes on either side bar into the space between said two face panels within said rectangular frame, and wherein said face panels each has a plurality of recessed portions curving inwards for reinforcing its structural strength.

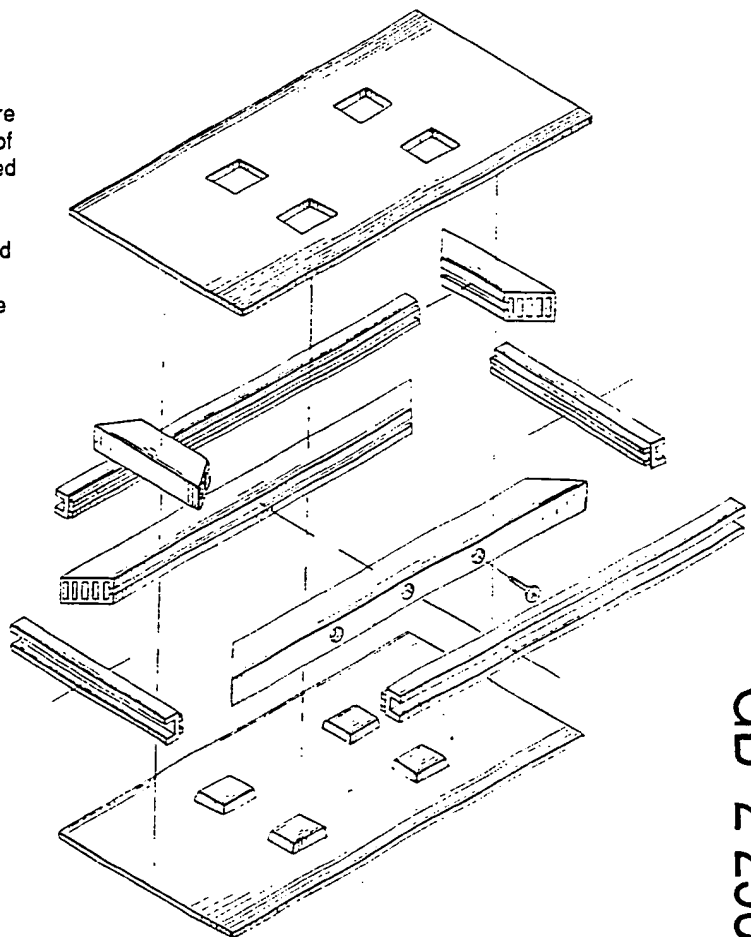


Fig. 6

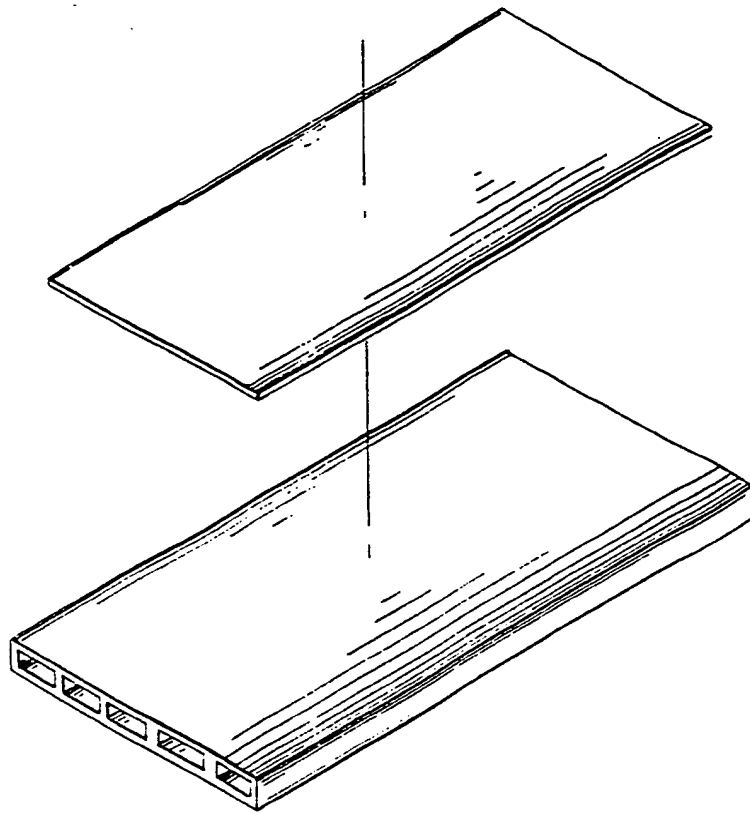


Fig. 1 PRIOR ART

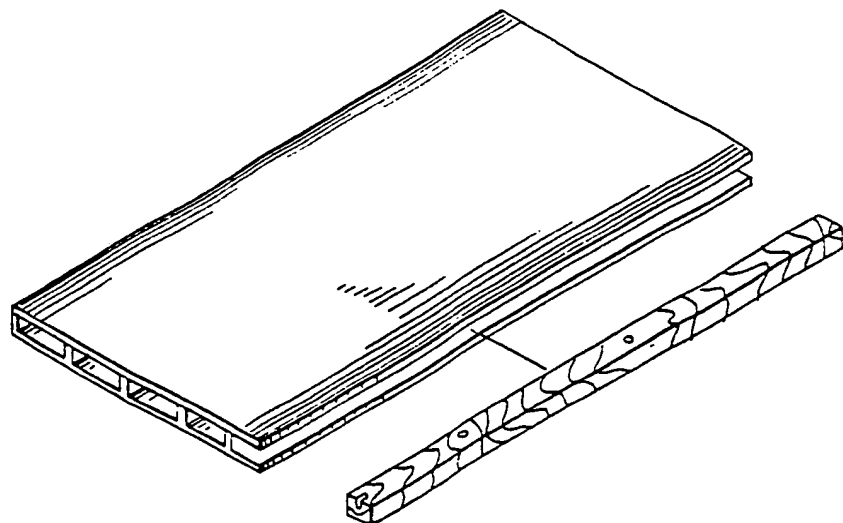


Fig. 2 PRIOR ART

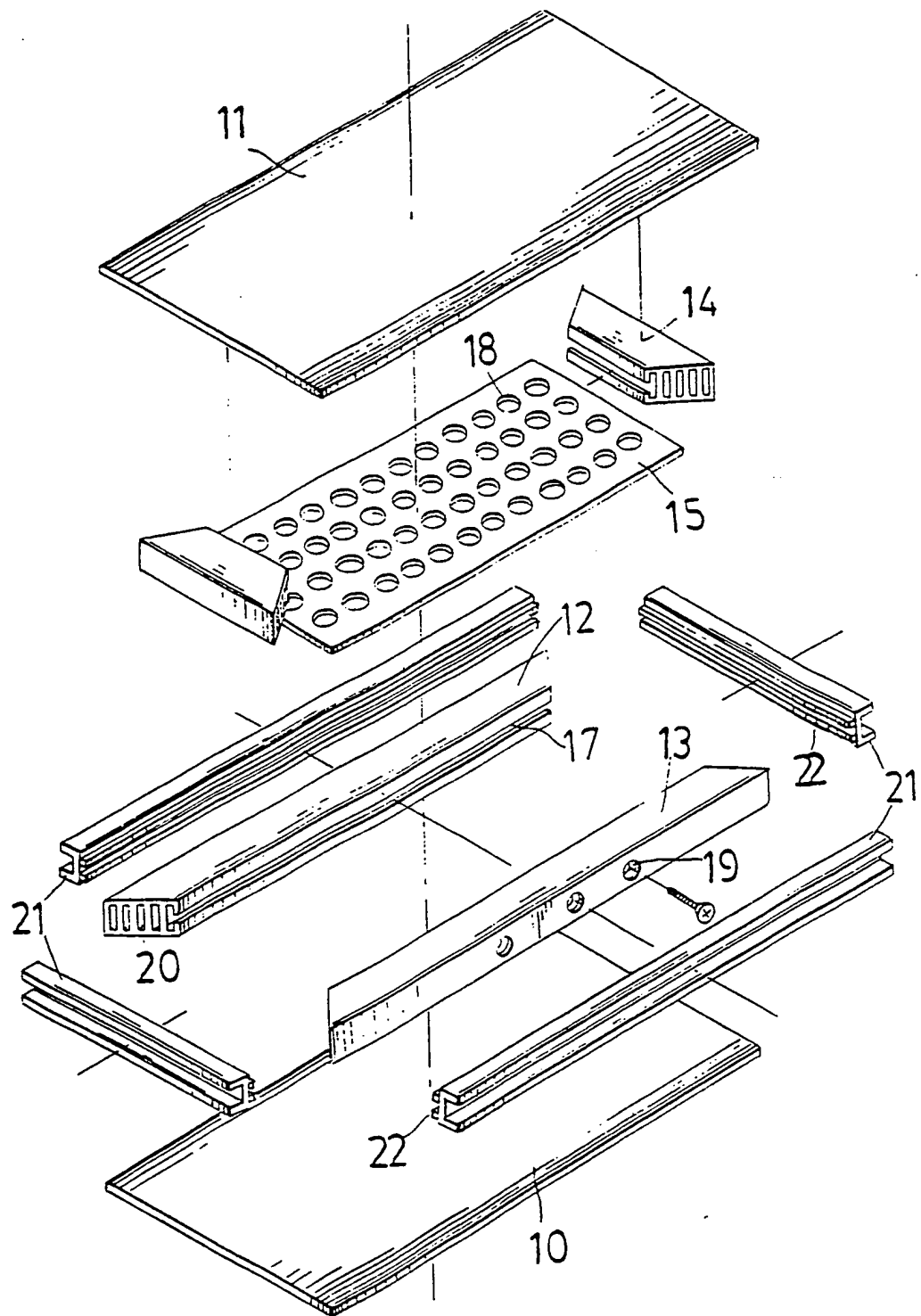


Fig. 3

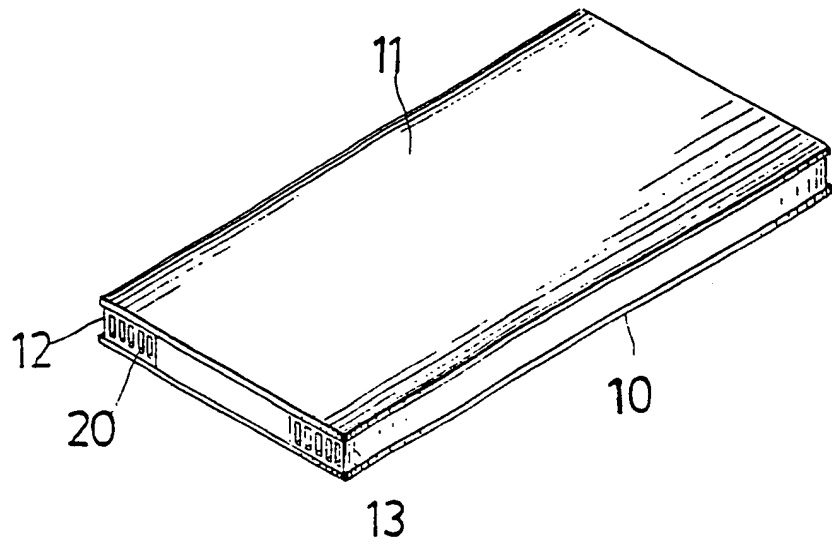


Fig. 4

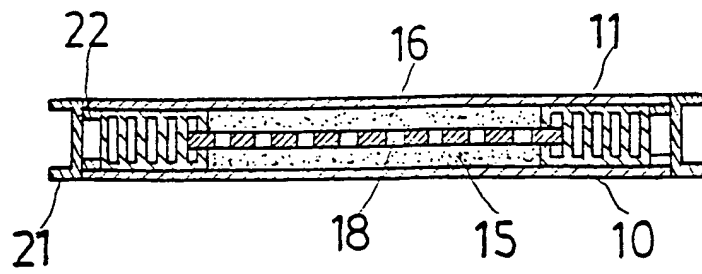


Fig. 5

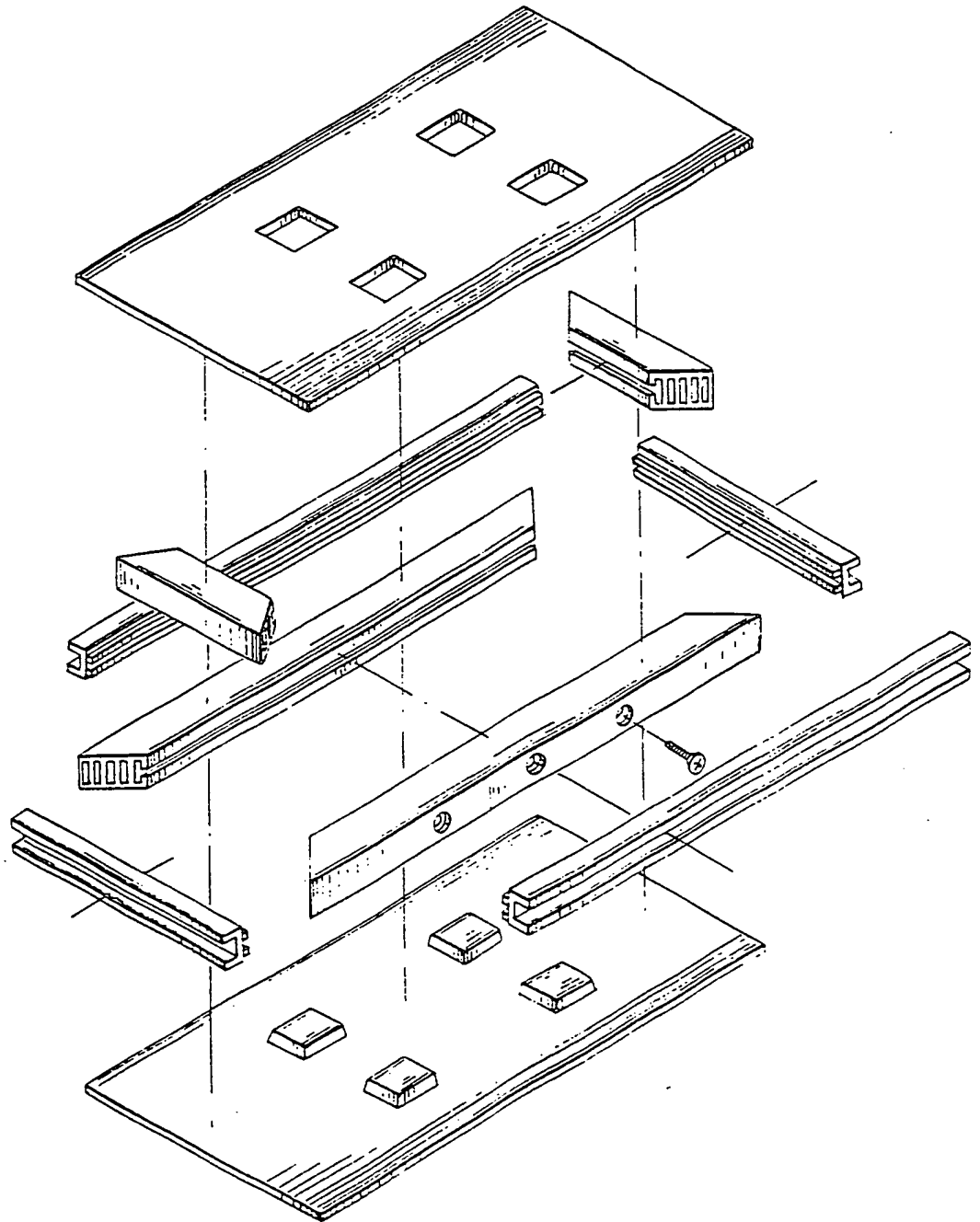


Fig . 6

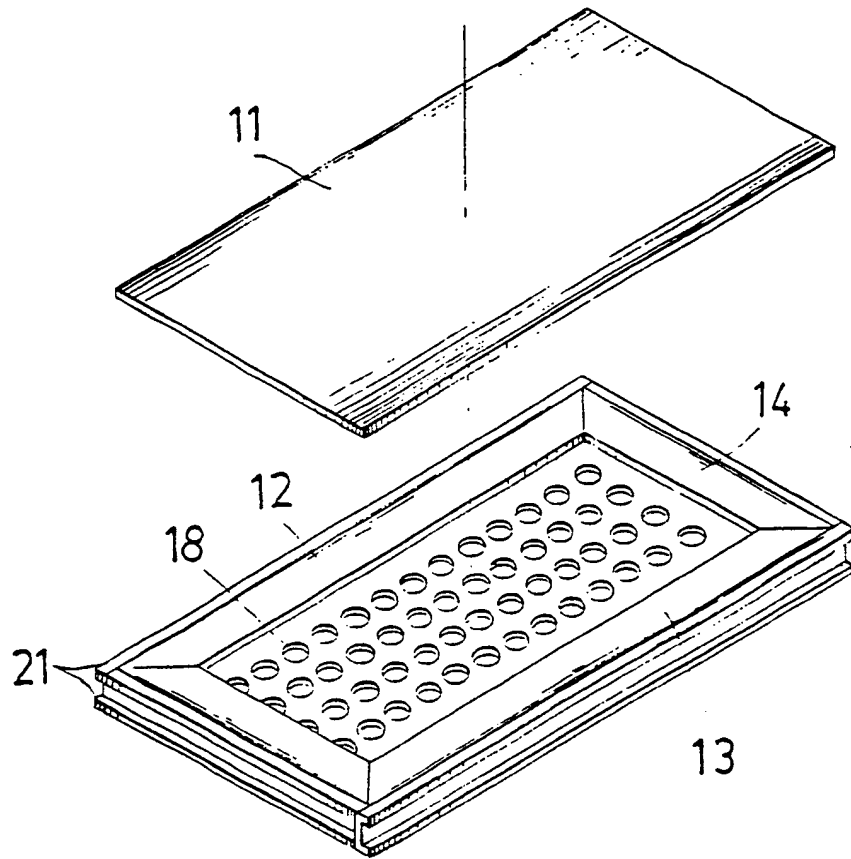


Fig. 7

DOOR PANEL

The present invention relates to a door panel and relates more particularly to a plastic door panel having a perforated steel plate fastened therein to reinforce the strength of the structure and the space between the two face panels and the rectangular frame is filled with of foamed plastic.

Various different materials are commonly used for making door panels. If plywood or wooden sheet is used for making a door panel, the door panel will be damaged easily. To obtain a strong structural strength, metal or fiber glass is commonly used for making door panels. However, metal or fiber glass door panels are heavy and expensive to manufacture. Recently, plastic material has been commonly used by door panel manufacturers for making door panels. Figs. 1 and 2 illustrate a plastic door panel according to the prior art. In this structure, a door panel is generally comprised of a base panel which is made from a plastic material in a hollow structure through the process of injection molding, and a veneer which is adhered to the surface of said base panel. The internal space of the base

panel is divided into various chambers by a plurality of partitions which are spaced from one another at a distance. Because this structure of door panel is a standardized product, it must be properly cut into a suitable size fitting the entrance in which it is to be installed. Because the partitions which reinforce the structural strength of the door panel are spaced from one another at a distance, the structural strength of the door panel may be affected if it is cut at either side. Therefore, a wooden bar is generally required, before the installation of the door panel, to insert in sheared edge so as to reinforce the structural strength.

The present invention has been accomplished to eliminate the aforesaid problems. It is therefore an object of the present invention to provide a plastic door panel which can be directly installed when it is properly cut into suitable size.

It is another object of the present invention to provide a plastic door panel which has means to reinforce its structural strength.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which:

5 Fig. 1 is an exploded perspective view of a plastic door panel according to the prior art;

Fig. 2 illustrates that a wooden bar is required to reinforce the structural strength of the plastic door panel taken on Fig. 1 when the plastic panel is sheared at one side for installation;

10 Fig. 3 is an exploded perspective view of the first embodiment of the present invention;

Fig. 4 is a perspective assembly view of the first embodiment of the present invention;

15 Fig. 5 is a sectional end view of the first embodiment of the present invention;

Fig. 6 is an exploded perspective view of the second embodiment of the present invention; and

20 Fig. 7 is a perspective view of the first embodiment of the present invention in which the back face panel is removed for showing the internal structure thereof.

Referring to the various drawings attached herewith, a detailed description of the structural features of " Door Panel " of the present invention is as follows:-

5 Referring to Figs. 3, 4, 5 and 7, therein illustrated is a steel plate reinforced door panel embodying the present invention which is generally comprised of two opposite face panels 10, 11, two side bars 12, 13, two end bars 14, a perforated steel plate 15, and a plurality of edge strips 21.

10 The two side bars 12, 13 and the two end bars 14 are respectively made from a hollow bar, which is made from a plastic material through the process of injection molding, having a plurality of parallel partitions 20 in longitudinal direction and a channel 17 longitudinally disposed at one side edge. Further, the side bar 13 has a plurality of
15 bolt holes 19 formed on one of the side edges thereof.

Assembly process of the present invention is simple and outlined hereinafter. Adhere the two side bars 12, 13 onto the surface of the lower face panel 10 at two
20 opposite sides and then, insert the perforated steel plate 15 in between the two side bars 12, 13 through the channels 17 thereof. As soon as the two end bars 14 are respectively

attached to the perforated steel plate 15 at two opposite ends, the upper face panel 11 is adhered to the two side bars 12, 13 and the two end bars 14. After assembly, two separate spaces are defined within the two face panels 10, 11, the two side bars 12, 13 and the two end bars 14 between the perforated steel plate 15. Then, foamed plastic 16 or suitable filler material is filled through the bolt holes 19 on the side bar 13 into the spaces within the two face panels 10, 11 and between the perforated steel plate 15 (see Fig. 5). Thus, a blank door panel is formed (see Fig. 4). Because the perforated steel plate 15 has a plurality of holes 18 thereon, foamed plastic 16 or suitable filler material which is filled through the bolt holes 19 can be uniformly distributed in the spaces within the two face panels 10, 11. As indicated, the two side bars 12, 13 and the two end bars 14 each has a plurality of parallel partitions 20 in longitudinal direction. The pitch between the partitions 20 is very small, and therefore, the structural strength of the blank door panel will not be affected when the panel is partly cut off. After the blank door panel is set up, the edge strips 21 are fastened in the peripheral edge of the blank door panel around the

outer surfaces of the side bars 12, 13 and the end bars 14 between the two face panels 10, 11. The edge strips 21 each has two elongated, parallel projections 22 disposed in longitudinal direction. By inserting the elongated, parallel projections 22 in either side bar 12 or 13, or either end bar 14, the edge strips 21 are conveniently firmly fastened around the peripheral edge of the blank door panel between the two face panels 10, 11. The edge strips 21 are provided not only to decorate the door panel but also to make its structure more stronger.

Referring to Fig. 6, therein illustrated is an alternate form of the present invention. In this embodiment, two face panels are attached to a rectangular frame, which is formed of two side bars and two end bars, at two opposed sides, foamed plastic or suitable filler material is filled through the bolt holes on either side bar into the space between the two face panels within the rectangular frame, and, edge strips are fastened around the peripheral edge of the door panel between the two face panels thereof. The main feature of this embodiment is that the two face panels each has a plurality of recessed portions symmetrically opposed to each other. The recessed portions

on the face panels which can be made in any of a variety of shapes reinforce the elastic property and the structural strength of the door panel. Further, because of the design of the recessed portions on the face panels, this embodiment of door panel will not be easily caused to deform when temperature is changed greatly.

CLAIMS:

1. A plastic door panel comprising two face panels adhered to a rectangular frame at two opposite sides, said rectangular frame being formed of two side bars and two end bars, a foamed plastic filled through a plurality of bolt holes on either one of said side bars into the space within said two face panels and said rectangular frame, and a plurality of edge strips fastened in between said two face panels around said rectangular frame at an outer side, and wherein said two face panels each has a plurality of recessed portions symmetrically opposed to each other.

2. The door panel of claim 1, wherein said recessed portions each curves outwards.

3. The door panel of claim 1, wherein said recessed portions each curves inwards.

4. A plastic door panel substantially as hereinbefore described with reference to, and as illustrated in, Figure 6 of the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

-9-

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Relevant Technical fields

(i) UK Cl (Edition K) E1J; JGL, JGS

(ii) Int CL (Edition 5) E06B

Search Examiner

J ROWLATT

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

1 JUNE 1992

Documents considered relevant following a search in respect of claims

1 TO 4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X,Y	GB 2236346 A (PERMADOOR) - the whole document is relevant	1-4
Y	GB 2133069 A (L.S.T. Corporation) - see Figure 7	1-4
Y	US 5016414 A (Guo-Chi Wang) - whole document relevant	1-4
Y	US 4643787 A (VERSATUBE CORP.) whole document relevant	1-4
Y	US 4550540 A (THERMA-TRU CORP.) see Figure 7	1-4
Y	US 4236365 A (WOOD PROCESSES) whole document relevant	1-4

Category	Identity of document and relevant passages	Relevance to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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